

Attachment for:
Retyping of 551 and B662

(Letter No.: DWF-101-02,
Correspondence Control No.: 02-RF-00458)

**B551 & B662 Gamma
Spectrometry Roof Coupon
Sample Results
(15 pages)**

4

RECEIVED

ADMIN RECCRD

IA-A-000907

1/16

DOT Non-Radioactive Determination
using 32 year-old Weapons Grade Plutonium, for CY 2001

Isotope	Det Limit (pCi/g)	Activity (pCi/g)	U-235/238 %wt. ratio	Uranium Determination
Am-241	8.61E+02	0.00E+00		
U-235	1.24E+00	0	#DIV/0!	Below MDA
U-238	5.88E+00	0.00E+00		
	Ci/g			
Am-241	0.00E+00			
Pa-234m	0.00E+00			
Pu-238	0.00E+00			
Pu-239	0.00E+00			
Pu-240	0.00E+00			
Pu-241	0.00E+00			
Pu-242	0.00E+00			
Th-230	Not Estimated			
Th-231	0.00E+00			
Th-234	0.00E+00			
U-234	0.00E+00			
U-235	0.00E+00			
U-236	Not Estimated			
U-238	0.00E+00			
Total (nCi/g)	0.0	0		
Total (Bq/g)	0.0			
DOT Status	Nonradioactive			
		uCi/g	Spl Wt	Tot uCi
		0	8.2	0

rin 02d0736-001.001

B551

W. K. Miller
02/05/02

B551 / B662
8 spec results

DOT Non-Radioactive Determination
using 32 year-old Weapons Grade Plutonium, for CY 2001

Isotope	Det Limit (pCi/g)	Activity (pCi/g)	U-235/238 %wt. ratio	Uranium Determination
Am-241	1.21E+00	0.00E+00		
U-235	1.81E+00	0	#DIV/0!	Below MDA
U-238	8.67E+00	0.00E+00		

	Ci/g
Am-241	0.00E+00
Pa-234m	0.00E+00
Pu-238	0.00E+00
Pu-239	0.00E+00
Pu-240	0.00E+00
Pu-241	0.00E+00
Pu-242	0.00E+00
Th-230	Not Estimated
Th-231	0.00E+00
Th-234	0.00E+00
U-234	0.00E+00
U-235	0.00E+00
U-236	Not Estimated
U-238	0.00E+00
Total (nCi/g)	0.0
Total (Bq/g)	0.0
DOT Status	Nonradioactive

uCi/g
0

Spl Wt Tot uCi
8.2 0

rin 02d0736-002.001

Handwritten signature
02/05/02

B551/B662
8 spec results

2/04/02

Mr. Chuck Hoelzel
Contract Technical Representative, Subcontract Number KH001076OZ
Kaiser-Hill Company, L.L.C.
Rocky Flats Environmental Technology Site
P.O. Box 464
Golden, CO 80402-0464

Dear Mr. Hoelzel;

On January 31, 2002, Canberra Mobile Laboratory Services (CMLS) received 2 metal roof coupon samples from B551 and B 662 to be counted using On-Site Radiological Screening by Gamma Spectrometry, RC10-B, Batch No. 0201314467. The Rin for this batch is 02D0736. The samples were requested to be counted as a Lab-NonStandard ISOCS sample. A 24 Hour Results Only package, containing the items specified in contract No. KH001076OZ dated February 1, 2000 and updated July 1, 2001 has been requested for this report.

The samples were counted using ISOCS. The samples had QA/QC appropriate to this type of analysis. Results of the analysis are attached in the batch report narrative.

The samples were counted for 7200 seconds. This count time was sufficient to meet the detection limit requirements of the client.

For your convenience, please find attached a sample cross-reference listing of Project sample identification numbers and the corresponding CMLS laboratory ID designator.

If you have any questions please do not hesitate to call at 303-966-7946.

Sincerely,

Larry Umbaugh
Laboratory Director, Canberra Mobile Laboratory Services

COVER PAGE
RC10B, On-Site Radiological Screening by Gamma Spectrometry

Gamma Spectrometry

**PROJECT SAMPLE IDENTIFICATION
CROSS-REFERENCE
TO CMLS SAMPLE LABORATORY IDs**

**BATCH 0201314467
Subcontract KH001076OZ**

COC NUMBER	PROJECT SAMPLE ID NUMBER	SITE SAMPLE NUMBER(S)	CMLS SAMPLE ID NUMBER(S)	OBJECT NUMBER(S) CMLS	LINE ITEM CODE(S)
02D0736#001	02D0736-001.001	02D0736-001.001	CMLS-909	G1900065	RC10B019
02D0736#001	02D0736-002.001	02D0736-002.001	CMLS-910	G1900066	RC10B019

Calibration Package ID: Objects individually modeled using ISOCS.

Comments:

Sample was counted in T130A using LeGe Detector LI004.

Certification Statement:

"I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this sample data package and the computer-readable EDD, as applicable, submitted on diskette or by modem, has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature."

Larry Umbaugh
Signature

Date: 02/04/02

Laboratory Director
Title

5

Page 4 of 15

CHAIN OF CUSTODY

[illegible]

CMLS Sample Data Package Narrative

Contract Number: KH001076OZ

RIN Number: 02D0736 **Batch Number:** 0201314467 **Date:** 02/04/02

Data Package Type: Lab NonStandard ISOCS **Level:** 24HrR

Analytical Summary:

Location of Analysis: RFETS, T130A

Measurement Type: Object, by ISOCS measurement

Statement of Work Number: Module RC10-B

Detector(s) Used: LeGe, ISOCS-characterized detector, LI004

Software Used for analysis: Canberra Industries ProCount 2000 version 1.0a using ISOCS Version 1.2b, and Genie 2K version 1.1

CMLS Procedures Used for Analysis: CMLS-019, CMLS-20, CMLS-022, and CMLS-023

MDA Requirements: Per contract

Were all MDA requirements met in the analysis X YES NO N/A

If NO, list the specific MDA that was not met:

Efficiency Curve used: Dual

CMLS Radionuclide Library Used for Analysis: Secular.LIB

Source of Library: The TABLE OF RADIOACTIVE ISOTOPES by Browne & Firestone, with low abundance Pu and Am peaks taken from "A Reevaluation of the Gamma Ray Energies and Absolute Branching Intensities of U-238, Pu-238, -239, -240, -241, and Am-241," Gunnink, R., Evans, J.E., and Prindle, A.L., Lawrence Livermore Laboratories, UCRL-52139, October 11, 1976.

Unidentified Peaks:

All unidentified peaks were dispositioned.

Total Propagated Error:

Total propagated error is determined from the counting error and the systematic error, when available. The systematic error is determined by comparing the ratios of the reported activities of Th-234 and Pa-234m or other pairs of nuclides with established ratios or the ratio of the activities of different energy lines of a nuclide. Systematic error is not calculated when no pairs of nuclides with established ratios are present in the sample.

Quality Control Summary:

Daily QC check source(s) counted? ☒ YES ☐ NO

Parameters within specification? ☒ YES ☐ NO

Action taken if not within specification:

Recount within specification? ☐ YES ☐ NO ☒ N/A

Do all QC samples meet the Data Quality Objectives? ☒ YES ☐ NO

If No, list specific QC sample ID and the DQO that was not met:

QA Background Count Performed? ☒ YES ☐ NO

If No, Explanation:

QA Criteria:

Upper and lower boundaries have been established for peak centroid warning and control limits for selected energy lines.
Upper and lower boundary limits for peak centroids are set as absolutes from the calibration centroids.
FWHM and activity parameters are controlled at 2 and 3 sigma limits for selected energies that cover the full range of energies in the spectrum. The limits for the QA parameters are derived from a running mean of the QA data collected since the initial calibration of the detector for the N-sigma parameters.

Nonconformance & Operational Variances:

None.

Discussion:

None.

MDA Calculation - Currie Method as specified in the Genie 2000 Customized Tools Manual, Appendix B; Basic Algorithms.

Canberra Project Manager/Manager's Designee Comments:

"I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this sample data package and the computer-readable EDD, as applicable, submitted on diskette or by modem, has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature."

"I certify that this electronic image, and all hardcopies produced from this image, accurately represents the data and is in compliance with the RFETS specific requirements, both technically and for completeness, other than the conditions detailed above or in the sample data package narrative. Release, by submission through email, the data contained in this electronic image and the computer-readable EDD (as applicable), has been authorized by the laboratory Manager or the Manager's designee."

Larry Umbaugh
Signature

Laboratory Director
Title

2/04/02
Date

QC Background and QC Performance Check Data were performed as required and were acceptable. Hardcopy printouts are on file at the CMLS office and are available upon request.

GAMMA SPECTROSCOPY

ANALYTICAL RESULTS

Analysis Results Header

2/04/2002 8:22:33 AM

Page 1

***** GAMMA SPECTRUM ANALYSIS *****
** Canberra Mobile Laboratory Services **

Report Generated On : 2/04/2002 8:22:33 AM

RIN Number : 02D0736
Analytical Batch ID : 0201314467
Line Item Code : RC10B019

Filename: A:\G1900065.CNF

Sample Number : 02D0736-001.001
Lab Sample Number : CMLS-909
Sample Receipt Date : 1/31/2002
Sample Volume Received : 8.20E+000 GRAMS

Result Identifier : N/A

Peak Locate Threshold : 3.00
Peak Locate Range (in channels) : 100 - 8192
Peak Area Range (in channels) : 100 - 8192
Identification Energy Tolerance : 1.500 keV

Sample (Final Aliquot Size) : 8.200E+000 GRAMS
Sample Quantity Error : 0.000E+000
Systematic Error Applied : 0.000E+000

Sample Taken On : 1/31/2002 10:30:00 AM
Acquisition Started : 1/31/2002 12:48:49 PM

Count Time : 7200.0 seconds
Real Time : 7203.2 seconds
Dead Time : 0.04 %

Energy Calibration Used Done On : 1/14/02
Energy = -0.509 + 0.250*ch + -6.15E-008*ch^2 + 6.19E-012*ch^3

Corrections Applied:
None

Efficiency Calibration Used Done On : 1/31/02
Efficiency Geometry ID : 02D0736-001.001

Analyzed By: Lee Jones Date: 2/4/02

Reviewed By: Sheri Chambers Date: 2/4/02

Sample and QC Sample Results Summary 2/04/02 8:22:33 AM Page 2

***** Sample and QC Sample Results Summary *****

Site Sample ID : 02D0736-001.001

Analytical Batch ID : 0201314467

Sample Type (Result Identifier): G19

Lab Sample Number : CMLS-909

Geometry ID : 02D0736-001.001

Filename: A:\G1900065.CNF

Detector Name: LEGE

MDA = Curie method as specified in Genie-2000 Customization Tools Manual
Appendix B; Basic Algorithms.

Analyte	Activity (pCi/GRAMS)	2-Sigma Uncertainty (pCi/GRAMS)	MDA (pCi/GRAMS)

K-40	2.69E+002	3.03E+001	2.23E+001
TL-208	0.00E+000	0.00E+000	1.52E+000
PO-210	0.00E+000	0.00E+000	1.70E+005
BI-212	0.00E+000	0.00E+000	2.71E+001
PB-212	3.65E+000	1.06E+000	1.66E+000
BI-214	6.10E+000	1.86E+000	2.91E+000
PB-214	0.00E+000	0.00E+000	2.77E+000
RA-224	0.00E+000	0.00E+000	2.30E+001
RA-226	0.00E+000	0.00E+000	1.99E+001
AC-228	0.00E+000	0.00E+000	5.82E+000
TH-230	0.00E+000	0.00E+000	7.91E+001
Th-231	1.14E+001	3.90E+000	4.91E+000
NP/U-233	0.00E+000	0.00E+000	3.02E+000
PA-234	0.00E+000	0.00E+000	1.42E+000
PA-234M	0.00E+000	0.00E+000	1.89E+002
U-235	0.00E+000	0.00E+000	1.24E+000
U238/234	0.00E+000	0.00E+000	5.88E+000
AM-241	0.00E+000	0.00E+000	8.61E-001

***** GAMMA SPECTRUM ANALYSIS *****
** Canberra Mobile Laboratory Services **

Report Generated On : 2/04/2002 8:59:44 AM

RIN Number : 02D0736
Analytical Batch ID : 0201314467
Line Item Code : RC10B019

Filename: A:\G1900066.CNF

Sample Number : 02D0736-002.001
Lab Sample Number : CMLS-910
Sample Receipt Date : 1/31/2002
Sample Volume Received : 5.40E+000 GRAMS

Result Identifier : N/A

Peak Locate Threshold : 3.00
Peak Locate Range (in channels) : 100 - 8192
Peak Area Range (in channels) : 100 - 8192
Identification Energy Tolerance : 1.500 keV

Sample (Final Aliquot Size) : 5.400E+000 GRAMS
Sample Quantity Error : 0.000E+000
Systematic Error Applied : 0.000E+000

Sample Taken On : 1/31/2002 10:30:00 AM
Acquisition Started : 1/31/2002 3:23:48 PM

Count Time : 7200.0 seconds
Real Time : 7203.2 seconds
Dead Time : 0.04 %

Energy Calibration Used Done On : 1/14/02
Energy = -0.509 + 0.250*ch + -6.15E-008*ch^2 + 6.19E-012*ch^3

Corrections Applied:
None

Efficiency Calibration Used Done On : 1/31/02
Efficiency Geometry ID : 02D0736-002.001

Analyzed By: Lee Jones Date: 2/4/02
Reviewed By: Sheri Chambers Date: 2/4/02

Sample and QC Sample Results Summary 2/04/02 8:59:44 AM Page 2

**** Sample and QC Sample Results Summary ****

Site Sample ID : 02D0736-002.001

Analytical Batch ID : 0201314467

Sample Type (Result Identifier): G19

Lab Sample Number : CMLS-910

Geometry ID : 02D0736-002.001

Filename: A:\G1900066.CNF

Detector Name: LEGE

MDA = Curie method as specified in Genie-2000 Customization Tools Manual
Appendix B; Basic Algorithms.

Analyte	Activity (pCi/GRAMS)	2-Sigma Uncertainty (pCi/GRAMS)	MDA (pCi/GRAMS)

K-40	4.21E+002	4.53E+001	2.78E+001
TL-208	0.00E+000	0.00E+000	2.73E+000
PO-210	0.00E+000	0.00E+000	2.49E+005
BI-212	0.00E+000	0.00E+000	3.94E+001
PB-212	3.45E+000	1.60E+000	2.57E+000
BI-214	8.67E+000	2.97E+000	4.38E+000
PB-214	0.00E+000	0.00E+000	4.14E+000
RA-224	0.00E+000	0.00E+000	3.44E+001
RA-226	0.00E+000	0.00E+000	2.90E+001
AC-228	0.00E+000	0.00E+000	8.40E+000
TH-230	0.00E+000	0.00E+000	1.12E+002
Th-231	1.75E+001	5.63E+000	6.57E+000
NP/U-233	0.00E+000	0.00E+000	4.34E+000
PA-234	0.00E+000	0.00E+000	2.05E+000
PA-234M	0.00E+000	0.00E+000	2.73E+002
U-235	0.00E+000	0.00E+000	1.81E+000
U238/234	0.00E+000	0.00E+000	8.67E+000
AM-241	0.00E+000	0.00E+000	1.21E+000